

Docket No. F-8624

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**REMARKS**

Claims 1-73 and 77 remain pending in this application. Claims 1-3, 9-37 and 43-72 are withdrawn. Claims 4, 38 and 73 are amended herein. Claim 74 was previously cancelled and claims 75 and 76 are cancelled herein.

The present invention is now characterized, as called for in the amended claims, by the technical feature of

(1) locally reducing the deformation resistance of a metal body extending in one direction by forming a low deformation resistance region crossing the metal body by cooling the metal body at two spaced locations and heating the metal body at a location between the two spaced locations; and

(2) subjecting the low deformation resistance region to shear deformation by twisting, thereby making the microstructure of said metal body fine.

Claims 4-8, 38-42, 73 and 75-77 are rejected under 35 U.S.C. §103(a) as obvious over Torizuka et al. (U.S. Pat. No. 6,221,178) in view of Yamaguchi et al. (JP 61-199540). In other words, the Office Action characterizes the claims as simply combining prior art elements according to known methods to yield predictable results.

MPEP §2143 states that when rejecting a claim based on the rationale that the recited structure is simply “combining prior art elements according to known methods to yield predictable results” there must be “a finding that one of ordinary

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skill in the art could have combined the elements as claimed ... and that in combination, each element merely performs the same function as it does separately.” MPEP §2143. Applicants respectfully traverse the rejections and, alternatively, aver that the claims as amended overcome the rejections at least for the reasons discussed below.

The Office Action asserts that Torizuka heats the metal body, and performs compressing using an anvil and cools the metal body. However, in Torizuka, heating, compressing and cooling are applied to the same portion of the metal body. In contrast, according to the present invention, heating and cooling are applied to different portions of the metal body so as to locally reduce the deformation resistance of the metal body. Accordingly, Torizuka fundamentally differs from the present invention with respect to the basic metal forming concept. Thus, even if, *arguendo*, Torizuka discloses twisting of a metal-body, the function of the twisting fundamentally differs from the present invention because the shear deformation is applied to a metal-body that is in a significantly different state.

The Office Action also asserts that Yamaguchi teaches heating device (13) and spaced cooling means (14, 15). However, an object of Yamaguchi is to form an upset portion having a large diameter compared to other portions by largely deforming a portion of the metal. Hence, Yamaguchi neither discloses nor suggests

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the idea of making the microstructure of the metal body fine. Furthermore, Torizuka, as discussed above, discloses a forming method where heating and cooling are applied to the same portion of the metal body. Accordingly, one skilled in the art could not combine the technical concepts disclosed in Torizuka and Yamaguchi to arrive at the current invention because Torizuka and Yamaguchi are different from each other in object as well as constitution. Therefore, the claims are not rendered obvious by Torizuka in view of Yamaguchi as the elements disclosed in Torizuka and Yamaguchi perform a different function from that of the elements recited in the claims.

No fee is believed due. If there is any fee due the USPTO is hereby authorized to charge such fee to Deposit Account No. 10-1250.

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In light of the foregoing, the application is now believed to be in proper form  
for allowance of all claims and notice to that effect is earnestly solicited.

Respectfully submitted,  
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